

1 CLAIMS:

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3 1. A microelectronic device fabricating method comprising:

4 providing a substrate having at least one beveled portion;

5 forming a layer of structural material on at least the at least

6 one beveled portion; and

7 removing at least a portion of the structural material from the

8 at least one beveled portion by anisotropic etching to form a device

9 feature from the structural material.

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11 2. The method of claim 1, wherein the substrate comprises a

12 layer of insulative material over a semiconductive wafer, the structural

13 material being formed over the insulative material.

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15 3. The method of claim 1, wherein the bevel is less than or

16 equal to about 45°.

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18 4. The method of claim 1, wherein the substrate comprises a

19 raised mandril and a semiconductive wafer, the raised mandril being

20 positioned over the wafer and having four edges, including two edges

21 substantially perpendicular to the wafer and two beveled edges, the

22 structural material being formed over at least one beveled edge.

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1 10. The method of claim 1, wherein the removing of structural
2 material comprises removing substantially all of the structural material
3 from the at least one beveled portion but leaving at least a portion
4 of the structural material on another portion of the substrate.

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6 11. The method of claim 10, wherein the structural material is
7 conductive.

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9 12. The method of claim 1, wherein the device feature
10 comprises an edge defined feature.

1 13. A microelectronic device fabricating method comprising:
2 providing a substrate having at least one beveled portion;
3 forming a layer of structural material on the substrate, including
4 on the at least one beveled portion; and
5 removing only a portion of the structural material from the at
6 least one beveled portion by anisotropic etching to form a device
7 feature from the structural material on the at least one beveled
8 portion.

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10 14. The method of claim 13, wherein the substrate comprises
11 a layer of insulative material over a semiconductive wafer, the
12 structural material being formed over the insulative material.

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14 15. The method of claim 13, wherein the bevel is less than or
15 equal to about 45°.

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17 16. The method of claim 13, wherein the forming of structural
18 material comprises depositing a substantially uniformly thick layer of
19 structural material over the substrate.

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21 17. The method of claim 13, wherein the structural material
22 comprises a chemical reaction or diffusion barrier material.

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1 18. The method of claim 13, wherein the device feature
2 comprises a pair of spaced, adjacent lines on the at least one beveled
3 portion.

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5 19. The method of claim 13, wherein the device feature
6 comprises a pair of spaced, adjacent, chemical reaction or diffusion
7 barrier material lines which are substantially void of residual shorting
8 stringers extending therebetween.

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1 20. A microelectronic device fabricating method comprising:
2 providing a substrate having at least one beveled portion,
3 wherein the bevel is less than or equal to about 45°;
4 forming a layer of chemical reaction or diffusion barrier material
5 over the substrate, including over the at least one beveled portion;
6 forming a resist mask pattern over the barrier material; and
7 with the mask pattern in place, anisotropically etching to form a
8 pair of spaced, adjacent barrier material lines which are substantially
9 void of residual shorting stringers extending therebetween.

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11 21. The method of claim 20, wherein the substrate comprises
12 a layer of insulative material over a semiconductive wafer, the barrier
13 material being formed over the insulative material.

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15 22. The method of claim 20, wherein the forming of structural
16 material comprises depositing a substantially uniformly thick layer of
17 structural material over the substrate.

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19 23. The method of claim 20, wherein the barrier material
20 comprises a metal comprising oxide or metal comprising nitride.

24. A microelectronic device fabricating method comprising:

providing a substrate with a base surface and a raised surface, the raised surface being raised out from the base surface and having at least one edge substantially perpendicular to the base surface and at least one beveled edge;

forming a layer of structural material on at least the at least one perpendicular edge and the at least one beveled edge; and

removing an effective amount of the structural material from the at least one beveled edge, the base surface, and the raised surface while leaving an effective amount of the structural material on the perpendicular edge to form an edge defined feature from the structural material on at least the at least one perpendicular edge.

25. The method of claim 24, wherein the substrate comprises a layer of insulative material over a semiconductive wafer, the structural material being formed over the insulative material.

26. The method of claim 24, wherein the bevel is less than or equal to about 45°.

1 27. The method of claim 24, wherein the raised surface
2 comprises a mandril and the base surface comprises a semiconductive
3 wafer, the mandril being positioned over the wafer and having four
4 edges, including two edges substantially perpendicular to the wafer and
5 two beveled edges.

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7 28. The method of claim 24, wherein the forming of structural
8 material comprises depositing a substantially uniformly thick layer of
9 structural material over the substrate.

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11 29. The method of claim 24, wherein the removing of
12 structural material comprises removing substantially all of the structural
13 material from the at least one beveled edge but leaving at least a
14 portion of the structural material on the at least one perpendicular
15 edge of the substrate.

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17 30. The method of claim 29, wherein the structural material is
18 conductive.

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20 31. The method of claim 24, wherein the device feature
21 comprises an edge defined feature.
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1 32. A microelectronic device fabricating method comprising:
2 providing a raised mandril over a substrate, the raised mandril
3 being raised out from the substrate and having at least one edge
4 substantially perpendicular to the substrate and at least one beveled
5 edge;

6 forming a layer of conductive material on at least the at least
7 one perpendicular edge and the at least one beveled edge;

8 anisotropically etching an effective amount of the conductive
9 material from the at least one beveled edge, the substrate, and the
10 mandril while leaving an effective amount of the conductive material
11 on the perpendicular edge to form an edge defined feature from the
12 conductive material on the at least one perpendicular edge; and

13 removing substantially all of the mandril.
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15 33. The method of claim 32, wherein the substrate comprises
16 a layer of insulative material over a semiconductive wafer, the
17 conductive material being formed over the insulative material.
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19 34. The method of claim 32, wherein the bevel is less than or
20 equal to about 45°.
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1 35. The method of claim 32, wherein the substrate comprises
2 a semiconductive wafer, the raised mandril being positioned over the
3 wafer and having four edges, including two edges substantially
4 perpendicular to the wafer and two beveled edges.

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6 36. The method of claim 32, wherein the forming of
7 conductive material comprises depositing a substantially uniformly thick
8 layer of conductive material over the substrate.

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1 37. A microelectronic device fabricating method comprising:
2 forming a resist mask pattern on a substrate, the resist pattern
3 having at least one beveled portion at an edge of at least one
4 opening in the resist pattern;
5 transferring the resist pattern to the substrate to form at least
6 one beveled portion of the substrate;
7 forming a layer of structural material on at least the at least
8 one beveled portion of the substrate; and
9 removing at least a portion of the structural material from the
10 at least one beveled portion by anisotropic etching to form a device
11 feature from the structural material.

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13 38. The method of claim 37, wherein the substrate comprises
14 a layer of insulative material over a semiconductive wafer, the
15 structural material being formed over the insulative material.

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17 39. The method of claim 37, wherein the bevel is less than or
18 equal to about 45°.

40. The method of claim 37, wherein the transferring the resist pattern forms a raised mandril from the substrate, the mandril having four edges, including two edges substantially perpendicular to a recessed portion of the substrate and two beveled edges, the structural material being formed over at least one beveled edge.

41. The method of claim 37, wherein the forming of structural material comprises depositing a substantially uniformly thick layer of structural material over the substrate.

42. The method of claim 37, wherein the structural material comprises a chemical reaction or diffusion barrier material.

43. The method of claim 42, wherein the barrier material comprises a metal comprising oxide or metal comprising nitride.

44. The method of claim 37, wherein the removing of structural material comprises removing only a portion of the structural material from the at least one beveled portion to leave a pair of spaced, adjacent structural material lines on the at least one beveled portion.

1 45. The method of claim 37, wherein the device feature
2 comprises a pair of spaced, adjacent, chemical reaction or diffusion
3 barrier material lines which are substantially void of residual shorting
4 stringers extending therebetween.

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6 46. The method of claim 37, wherein the removing of
7 structural material comprises removing substantially all of the structural
8 material from the at least one beveled portion but leaving at least a
9 portion of the structural material on another portion of the substrate.

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11 47. The method of claim 46, wherein the structural material is
12 conductive.

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14 48. The method of claim 37, wherein the device feature
15 comprises an edge defined feature.
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1 49. A microelectronic device fabricating method comprising:
2 providing a layer of resist material on a substrate;
3 exposing the resist to actinic energy providing gradated exposure
4 of a second resist region;
5 developing the resist to remove a first region, revealing the
6 substrate, and a portion of the second region, without revealing the
7 substrate, while leaving a third region in place to form a resist mask
8 pattern on the substrate, wherein a beveled portion of the resist
9 pattern forms in the second region;
10 transferring the resist pattern to the substrate to form at least
11 one beveled portion of the substrate;
12 forming a layer of structural material on at least the at least
13 one beveled portion of the substrate; and
14 removing at least a portion of the structural material from the
15 at least one beveled portion by anisotropic etching to form a device
16 feature from the structural material.

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18 50. The method of claim 49, wherein the substrate comprises
19 a layer of insulative material over a semiconductive wafer, the
20 structural material being formed over the insulative material.
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1 51. The method of claim 49, wherein the bevel is less than or
2 equal to about 45°.

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4 52. The method of claim 49, wherein the transferring the
5 resist pattern forms a raised mandril from the substrate, the mandril
6 having four edges, including two edges substantially perpendicular to a
7 recessed portion of the substrate and two beveled edges, the structural
8 material being formed over at least one beveled edge.

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10 53. The method of claim 49, wherein the forming of structural
11 material comprises depositing a substantially uniformly thick layer of
12 structural material over the substrate.

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14 54. The method of claim 49, wherein the structural material
15 comprises a chemical reaction or diffusion barrier material.

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17 55. The method of claim 54, wherein the barrier material
18 comprises a metal comprising oxide or metal comprising nitride.

1 56. The method of claim 49, wherein the removing of
2 structural material comprises removing only a portion of the structural
3 material from the at least one beveled portion to leave a pair of
4 spaced, adjacent structural material lines on the at least one beveled
5 portion.

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7 57. The method of claim 49, wherein the device feature
8 comprises a pair of spaced, adjacent, chemical reaction or diffusion
9 barrier material lines which are substantially void of residual shorting
10 stringers extending therebetween.

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12 58. The method of claim 49, wherein the removing of
13 structural material comprises removing substantially all of the structural
14 material from the at least one beveled portion but leaving at least a
15 portion of the structural material on another portion of the substrate.

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17 59. The method of claim 58, wherein the structural material is
18 conductive.

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20 60. The method of claim 49, wherein the device feature
21 comprises an edge defined feature.

1 61. An integrated circuit comprising:

2 a) a semiconductive substrate;

3 b) a layer of dielectric material over the substrate, the dielectric
4 material layer having a base surface and a raised surface, the raised
5 surface being raised out from the base surface and having at least
6 one beveled edge and a step parallel to the base surface; and

7 c) a pair of spaced, adjacent, chemical reaction or diffusion
8 barrier material lines with a portion extending over the at least one
9 beveled edge from the base surface to the step of the raised surface,
10 wherein the spaced lines are substantially void of residual shorting
11 stringers extending therebetween.

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13 62. The integrated circuit of claim 61, wherein the bevel is
14 less than or equal to about 45°.

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16 63. The integrated circuit of claim 61, wherein the barrier
17 material comprises a metal comprising oxide or metal comprising
18 nitride.

1 64. An intermediate construction of an integrated circuit
2 comprising:
3 a) a semiconductive substrate;
4 b) a raised mandril over the substrate, the raised mandril being
5 raised out from the substrate and having at least one edge
6 substantially perpendicular to the substrate and at least one beveled
7 edge; and
8 c) a layer of structural material forming an edge defined feature
9 on the at least one perpendicular edge.

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11 65. The method of claim 64, wherein the bevel is less than or
12 equal to about 45°.

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14 66. The method of claim 64, wherein the raised mandril
15 comprises four edges, including two edges substantially perpendicular
16 to the substrate and two beveled edges.

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18 67. The method of claim 64, wherein the structural material is
19 conductive.
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